

Section 13 Disaster and Emergency Response

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Disaster and Emergency Response

13.1 Introduction

This section discusses flood hazard mitigation and disaster response related to possible pre-disaster or immediate actions to protect water resources. It also describes programs and mechanisms now in place along with those needed.

Reacting to a disaster or emergency after it has occurred is generally inefficient. This wastes time, money and other resources. Loss of life and threats to health and welfare are also possible. Pre-disaster activities such as floodplain management, hazard mitigation and mitigation planning are the preferred approaches.

13.2 Background

Statutory authority to carry out disaster related programs, including pre- and post-disaster hazards, exists at all levels of government. No entity, however, has all of the necessary authority to implement actions to mitigate a specific hazard or disaster. Agencies with specific authorities and assistance programs are discussed in the *Utah State Water Plan, 1990*; Section 3, Introduction; Section 13, Disaster and Emergency Response and Section 16, Federal Water Planning and Development.⁴

Disasters are always traumatic experiences for those affected.

Any emergency must be alleviated, but there is always a drain on resources.

The Division of Comprehensive Emergency Management is responsible for disaster and emergency response at the state level.

13.3 Policy Issues and Recommendations

Policy issues regarding hazards, disasters and emergencies are discussed below. The prime responsibilities for most of these rest with local units of government. Also see Section 13, *State Water Plan, 1990*.

13.3.1 Hazard Mitigation Plans

Issue - Local governments should prepare hazard mitigation plans to protect life and property.

Discussion - A hazard mitigation plan is a joint effort requiring input from each involved office or agency to list many of the hazards facing a jurisdiction, to identify mitigation recommendations, to define implementation strategies with time frames,

to estimate costs and prioritize each recommendation. The objective is to save money over the long run and to protect life and property.

Hazard mitigation may include structural and non-structural activities as they relate to flood prevention. Continued active involvement in the National Flood Insurance Program is essential to ensure adequate floodplain management objectives to reduce flood losses. Hazard mitigation plans can be implemented by communities to deal with identified hazards in the region such as flooding.

The Division of Comprehensive Emergency Management performs functions relating to hazard mitigation plans at the state level. They are responsible to prepare, implement and maintain mitigation plans and programs.

Recommendation - Local towns, cities and counties should prepare hazard mitigation plans with assistance from the Division of Comprehensive Emergency Management.

13.3.2 Floodplain Management

Issue - Local governments need to become aware of their responsibilities as it relates to floodplain management in order to qualify for the National Flood Insurance Program.

Discussion - The National Flood Insurance Program (NFIP) was established by Congress in 1968 as a result of large federal outlays for structural measures and disaster relief. Its purpose is to (1) reduce flood losses, (2) prevent unwise development in floodplains and (3) provide affordable flood insurance to the public.

Approximately 16 communities in the basin area are participating in the NFIP.

The general area has approximately 56 policies in force and total coverage of approximately \$3,741,000. A community agrees to enact and enforce minimum floodplain management requirements as stated in the Code of Federal Regulations, found in Part 60.3. In exchange for enforcing these regulations, flood insurance is made available to those who want coverage. Regulations apply to new construction and substantial improvements.

The Division of Comprehensive Emergency Management is the State Coordinating Agency for NFIP. The office can assist local participating communities in the implementation of the floodplain management objectives as defined by the NFIP.

Recommendation - Local entities should conduct an educational program to make residents aware of the benefits under the National Flood Insurance Program. The Division of Comprehensive Emergency Management should assist as needed.

13.3.3 Disaster Response Plans

Issue - All communities and counties in the basin should have a disaster response plan.

Discussion - Local governments need to increase their ability to respond to natural disasters and emergencies. Response plans need to be prepared ahead of time. Counties, cities and towns can coordinate efforts and responsibilities. Decisions should be made on leadership positions and activation of response activities. Disruption, contamination or exceptional shortfall in water supplies can occur during emergency situations and may result in a temporary

limitation of available water. When this happens, water deliveries may need to be prioritized in order to ensure critical needs are met first.

Kane and Washington counties have emergency operations plans in place. Emergency action plans have been prepared for Gunlock, Quail Creek, Ash Creek and Kolob reservoirs. These response plans address potential flood disasters.

The Division of Comprehensive Emergency Management has the statewide responsibility of planning for, responding to, recovering from and mitigating emergencies. They have developed statewide plans for disaster response. This agency can assist local entities prepare response plans for emergency situations.

Recommendation - Local entities should develop disaster response plans with assistance from the Division of Comprehensive Emergency Management.

13.3.4 Flood Prevention and Floodwater and Sediment Control

Issue - Flooding is a problem throughout the basin. Measures need to be taken to prevent future damages.

Discussion - Records show floods have occurred since the earliest settlements in the basin. These floods have mostly damaged agricultural developments and facilities, but lately they have caused increased damage to residential areas. Construction of water storage reservoirs should include space for floodwater and sediment storage. The design should also provide for passing peak flows safely. Various other measures for controlling flood water and sediment are available. These include structural and non-structural measures as well as management activities in the watershed areas.

Several state and federal agencies have programs and funding for floodwater control. These agencies can assist local entities in many instances.

Recommendation -

Counties should establish floodwater control committees to develop and carry out flood prevention plans and to assist other entities with flood problems.



13.4 Local Organizational Structure

The cities and counties have primary responsibility for disaster response. Most entities have delegated responsibilities to specific individuals in their respective organizations. This was apparent after the

September 1992 Springdale earthquake where water and power interruptions were quickly restored.

13.5 Flooding Problems

Three types of storms produce flooding in the area. These are the general winter storms occurring between November and April which produce the watershed snowpack, the general summer storms occurring between May and October and the summer thunderstorms which normally occur between July and October.

Major flooding along the Virgin River is typically a result of the large general storms. Thunderstorms cover comparatively small areas and are usually a major factor in the flooding of the smaller tributaries to the Virgin River.

The same is true in the Kanab Creek and Johnson Wash drainages. Because of the smaller drainage areas, they are more susceptible to localized storms and cloudbursts.

Natural and man-made obstructions also affect flooding. Such obstructions include bridges across the rivers and streams, brush, large trees and other vegetation growing along the streambanks in the flood plain areas. In general, obstructions restrict flood flows and can cause over-bank flows; unpredictable areas of flooding; destruction of or damage to, bridges, homes, and businesses and increased velocity of flow immediately downstream thereby scouring the stream channel.

Damaging floods on major watercourses are known to have occurred in the vicinity of St. George as early as 1858. See Section 5.3 for peak flow data. Since that time, several major floods have occurred on the Virgin River with the December 1966 flood

having the highest recorded peak discharge. The flood of August 1971 had the highest recorded peak discharge on Fort Pierce Wash. The highest recorded peak discharge on Kanab Creek occurred during the flood of September 8, 1961.

Floods of the same or larger magnitude as those occurring in the past could take place in the future. Larger floods have been experienced in the past on other streams with geographical and physiographical characteristics similar to those found in the study area.

13.6 Drought Problems

Drought is a continuing problem because most of the basin is below 7,000 feet in elevation. As a result, winter snowpack accumulation is limited. This limits annual water yield rates and corresponding streamflow volumes and groundwater aquifer recharge. Refer to Section 5, Water Supply and Use, for streamflow data and Section 19, Groundwater, for aquifer data.

The hot, summer climate of most of the basin makes frequent irrigation of crops imperative. However, mid-summer generally brings low and non-existent streamflow in areas without water storage facilities. As a result, crops suffer. Even in the higher elevations, rangeland production of feed for livestock is reduced.

13.7 Other Water-Related Disaster Problems

Other disasters, generally more localized than flooding or drought, can impact water supplies. These disasters include such things as earthquakes, landslides and structural failure of water supply facilities. The Hurricane fault and Sevier Valley fault zones are high risk areas.

13.8 Flood Prevention and Drought Reduction Alternatives

In connection with the *Virgin River Basin Cooperative Study* report, a reconnaissance level hydrologic examination of the incidental flood control of two proposed water supply reservoirs was undertaken. The two sites are Shem, on the Santa Clara River (maximum water supply capacity of 25,000 acre-feet), and North Creek above the Virgin River confluence (maximum water supply capacity of 22,000 acre-feet). The damage centers are located at Green Valley on the Santa Clara River, the Virgin River above Fort Pierce Wash and the Virgin River at Bloomington below the Santa Clara River confluence.

To establish "without project" base conditions, the Virgin River basin was modeled without the proposed reservoirs. The Shem and North Creek sites were then each included in the model as water conservation reservoirs with no dedicated flood control pool. The 10-year and 100-year peak discharges were determined with and without the proposed reservoirs, based on computer modeling results, and plotted on log-frequency paper. Discharge frequency results from with and without project conditions indicate a reservoir on North Creek above the Virgin River confluence would have no significant effect on downstream peak discharges.

A reservoir at the Shem site also would have no significant reduction of peak discharges for the Virgin River. However, peak discharges on the Santa Clara River at Green Valley above the Virgin River confluence are very sensitive to the amount of water supply during a flood event at the Shem location. For a more detailed explanation of the evaluation for flood

control of these proposed water supply reservoirs, see the Corps of Engineers draft report on the subject¹.

Similar studies should also be made of other potential sites to determine flood control possibilities. A potential debris basin site exists on Quail Creek to protect Quail Creek Reservoir. Efforts on the Muddy Creek upper watershed above Mt. Carmel are good examples of management and non-structural flood prevention measures. Flood Plain Management studies are underway in and northeast of Kanab.

Drought is probably the most perennial problem in the basin, due to the low precipitation rate. Lack of water storage facilities also contributes to the problem.

Weather modification is a method for increasing the precipitation rate. Cloud-seeding requires the right conditions to be most effective. Significant increases in precipitation may not be possible during prolonged dry conditions. Generally, this is a viable alternative available on a continuing basis.

Another alternative is increased use of water storage facilities. Several reservoir sites have been identified where water could be stored to supplement supplies during drier periods on a seasonal or holdover basis.

Groundwater development is another alternative for consideration. This may entail mining during prolonged dry periods. See Section 9.7, Water Development and Management Alternatives, and Section 19, Groundwater.

13.9 Disaster Response Recommendations

Several actions deserve consideration to alleviate disaster situations. Having plans or

facilities in place prior to disaster response requirements is always more effective.

Suggested actions include

1) development of disaster response plans by individual communities and counties, 2) investigation and construction of water storage and floodwater prevention projects, 3) continuation of weather modification programs and 4) family emergency plans. The Utah State Division of Comprehensive Emergency Management suggests all residents prepare a 72-hour emergency survival kit, which experts say is adequate time for relief efforts to reach most residents. Along with preparing a 72-hour kit, families should develop their own

emergency plan outlining each member's responsibility during a disaster. Emergency preparedness drills are a good way to familiarize family members with their duties and help ensure the safety of each.

Hazard mitigation may include structural and non-structural activities as they relate to flood prevention. Continued active involvement in the National Flood Insurance Program is essential to ensure adequate floodplain management objectives to reduce flood losses. Hazard mitigation plans can be implemented by communities to deal with identified hazards in the region, such as flooding. ■

13.10 References

1. Corps of Engineers. *Hydrology for Evaluation of Proposed Water Supply Reservoirs*. Los Angeles, California, 1988.
2. U.S. Department of Agriculture, Soil Conservation Service and Utah Department of Natural Resources, Division of Water Resources. *Virgin River Basin - Utah Cooperative Study*. Salt Lake City, Utah, 1990.
3. Utah Division of Water Resources. *Utah Drought Response Plan*. Salt Lake City, Utah, 1990.
4. Ibid. *Utah State Water Plan*. Salt Lake City, Utah, 1990.